The Best Systems Made Better

TEMP-PLATE® INFLATED HEAT TRANSFER SURFACE

MUELLER

Temp-Plate® Inflated Heat Transfer Surface

Custom Heat Transfer

Paul Mueller Company's Temp-Plate® is a custom inflated heat transfer surface that is crafted to your specifications dependant on application, operating pressure and size.

Temp-Plate utilizes two sheets of stainless steel, titanium Grade 1, carbon steel, and high alloy metals that are spot welded and seamed around the edges to create a single panel. After the panel is welded, it is inflated to create space for the flow of a heating or cooling medium that keeps a constant and turbulent flow between the welded panels.

Highly Versatile

There are a wide variety of uses for Temp-Plate. Available in custom panel, immersion, clamp-on, bank, plate drum, and integral assemblies, Temp-Plate is suitable for applications in chemical, aerospace, beverage, and many other industries.

Efficient

Mueller Temp-Plate is efficient by design to provide you with the best energy-saving heat transfer options. Mueller will help guide you through design with sizing, material gauges, finishes and more to provide you with economical heat transfer specific to your requests.

Dependable

Customer satisfaction is a priority at Paul Mueller Company. That's why we put quality craftsmanship into every piece of Temp-Plate that goes out our door. We ensure each Temp-Plate panel is ready to withstand high pressures, extreme temperatures, harsh environments, and back it with constant testing and improvements and over 75 years of manufacturing experience.

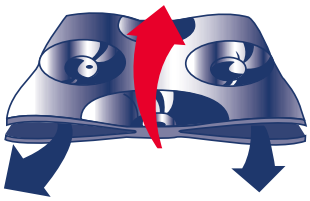
"Applications for Temp-Plate exist as far as the imagination will take you."

- Lance Briggs
  Temp-Plate
  Business Unit Manager

Temp-Plate Welding Styles

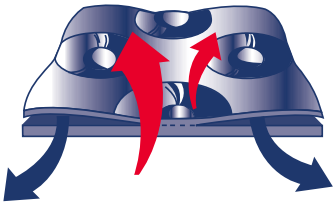
Double Embossed Surface

Inflated Both Sides—Commonly used in immersion applications, the Mueller Temp-Plate double embossed construction maximizes the heating and cooling process by utilizing both sides of the heat transfer plate.



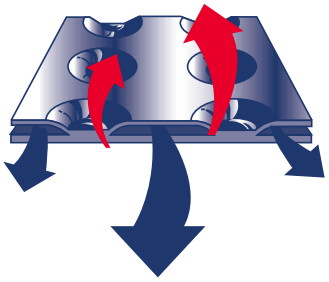
Single Embossed Surface

Inflated One Side—Mueller Temp-Plate single embossed heat transfer surface is economical when used for interior tank walls, conveyor beds, or when a flat side is required.



Dimpled Surface

Dimpled One Side—Dimpled Mueller Temp-Plate construction is machine punched and swaged prior to welding to increase the flow area in the passages.



All styles available in stainless steel, other alloys, and carbon steel; in many materials, gauges, and working pressures.

Duplex Steel Options

Depending on your application, Paul Mueller Company can utilize 2205 duplex stainless or LDX 2101 steel to fabricate your Temp-Plate heat transfer panels. The duplex structure of austenite and ferrite provides a combination of attractive qualities. Both steel grades provide improved corrosion resistance without sacrificing overall heat transfer when compared to other competitive steel grades. Ask our experts about 2205 duplex stainless or LDX 2101 steel for your operations.

Benefits

- High strength, lightweight duplex steel
- Advanced corrosion resistance
- Competitive heat transfer rates
- Lower thermal expansion than alternatives

Temp-Plate Inflated Bank Assembly

Wasted Resources

Typically suited for large scale applications, Temp-Plate inflated bank assemblies could be the missing link in your facility. Bank assemblies consist of multiple Temp-Plate panels packed and welded together for large amounts of heat transfer surface area. They can be used in a variety of exhaust streams, as well as being immersed in a liquid bath for heat recovery.

Top quality heating and cooling capabilities with exceptional energy recovery means more cost savings to go straight to your bottom line. A wide variety of material gauges and types allows us to fabricate a long-lasting energy recovery system.

Why Bank Assembly?

Reduced Energy Consumption

Custom-crafted equipment recovers and recycles energy in your plant

Compact Size

A variety of configurations and sizes allows for efficient heat transfer even in small spaces

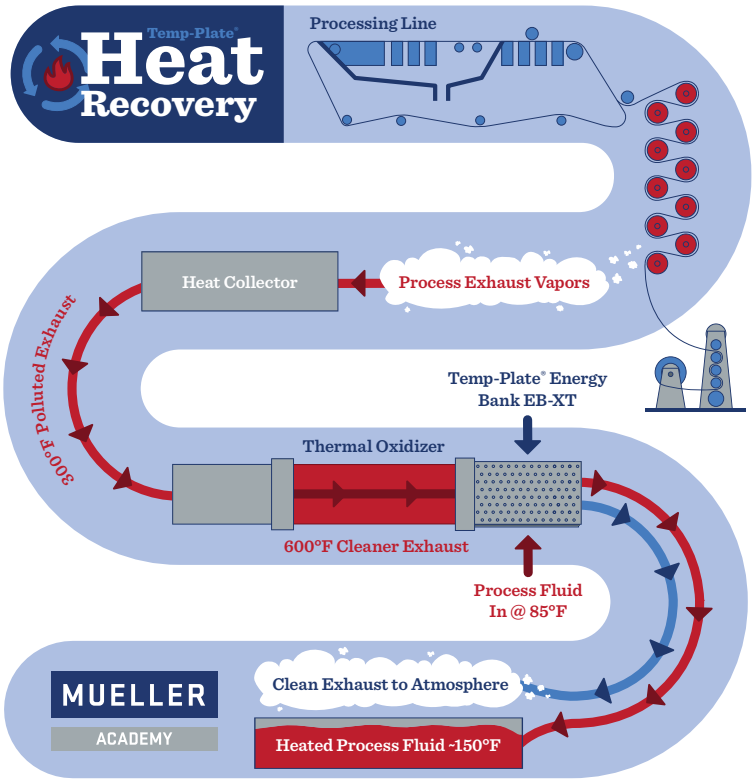
Heat Recovery in a Chemical Processing Plant

You have the difficult task of identifying processes in your facility where you can go green. There are hidden opportunities throughout your plant to be more sustainable and efficient, but you need someone who's an expert on the subject to pinpoint them and provide solutions. If your company is implementing or has implemented a comprehensive sustainability policy, heat recovery may be a way to reach your goals. Here is one example to get you thinking about your specific opportunities.

The Energy Recovery Process

We partnered with a chemical processing plant in Alabama in an effort to recover some of their valuable wasted heat energy. During their manufacturing process, the company was using large amounts of energy and emitting hot gases into the atmosphere at 300°F. The exhaust contained various volatile organic compounds and fibrous materials that had to be eliminated to comply with local air regulations and to be kinder to the environment. To do this, the company used a natural gas thermal oxidizer to heat the gases to around 600°F, burning off pollutants and converting contaminated gases into environmentally safe gases.

The cleaner, superheated gas was then discharged into the atmosphere, along with all their energy dollars. The solution was a Paul Mueller Company Temp-Plate Energy Bank.



Now, the superheated gas passes through the Temp-Plate Energy Bank before escaping into the atmosphere. The gas heats a process fluid from 85°F to ~150°F as it flows through the energy bank. Then, the process fluid is pumped to other locations within the plant where the heat can be utilized in other applications.

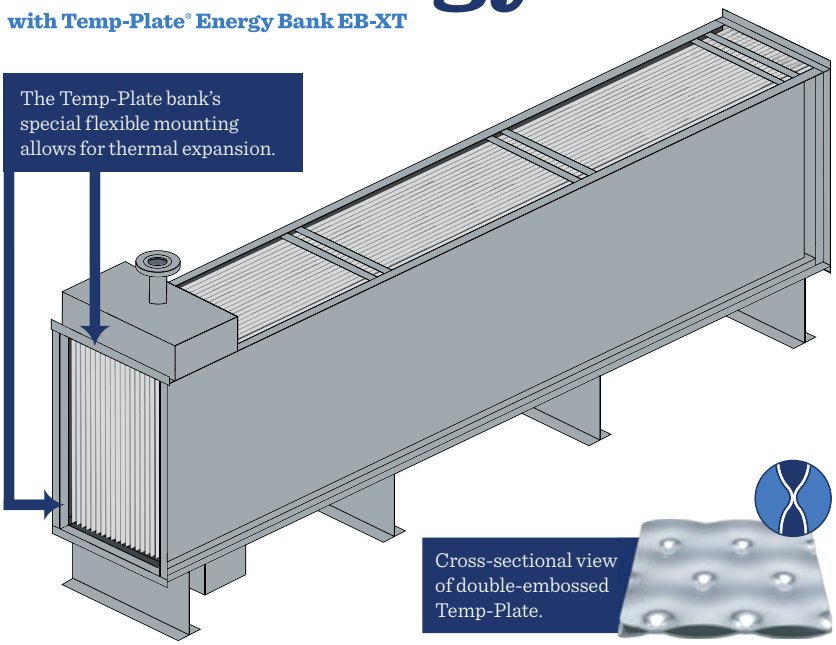
Over $1,000,000 in Energy Savings

By now utilizing the wasted heat energy, the Alabama processing plant has been able to save over $1,000,000 in energy costs. The investment into sustainable technology has benefited both the plant and our customer's bottom line.

Save Money and Energy

MUELLER ACADEMY

with Temp-Plate® Energy Bank EB-XT



Paul Mueller Company is proud to partner with those committed to sustainability. If you are interested in how you can make your processes more efficient, we would be glad to help.

Academy

Learn more about how heat recovery can work for you.

Find articles, guides, and other resources dedicated to heat recovery, applications, and more at **ACADEMY.PAULMUELLER.COM**

Temp-Plate Immersion Assembly

Built to Last

Your application may require heat transfer directly to the source. Whether you're heating a chemical bath to anodize aluminum or manufacturing polyethylene, Paul Mueller Company will help you implement Temp-Plate Immersion Assembly, to help your process move at maximum efficiency. Our immersion panels are suited for direct heating or cooling of liquids, often highly corrosive. Our equipment is fabricated by experienced craftsmen and tested to strict standards.

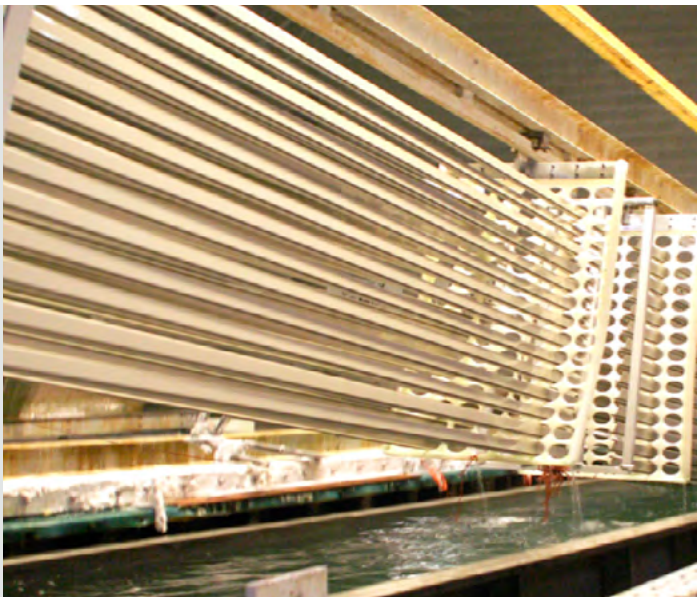
Why Immersion Assembly?

Unique Design

Designed to reduce fatigue failure due to condensate build-up

Variety of Applications

Available in an assortment of materials, gauges, and working pressures to be used in a range of industries



Immersion Assembly in Log Ponds

When wood logs need to be reserved for periods of time above freezing temperatures, it is best practice to keep them wet by using log ponds or other methods to avoid issues like end checking or decomposition from insects. Keeping logs immersed in temperature controlled water can help soften and loosen bark before treating and processing. Proper treatment and storage of logs can greatly affect the outcome of the product, and help defend against the possibility of warping or freezing.

Maintaining your log pond at a constant temperature is an effective method to producing lumber that meets expectations and leaves you with peace of mind that your wood is preserved.

Temp-Plate Immersion Assembly is an excellent way to keep your log pond at optimal temperatures. Through immersion, Temp-Plate panels will have direct contact to the solution to be heated or cooled, without cross-contamination. Paul Mueller Company will design immersion panels to meet the specific needs of your process.

Temp-Plate Clamp-On Assembly

Suited for a Variety of Applications

Clamp-on assemblies are ideal for heating or cooling the contents of your processing tank or vessel to drive efficiency and allow you to produce a consistent product.

Styles

- Pipe Clamp-On
- Shell Clamp-On
- Cone Clamp-On
- Head Clamp-On

Our clamp-on heat transfer surface can be crafted, welded, and applied to your system with minimal to no equipment downtime, depending on your application. Paul Mueller Company provides high-grade materials, impeccable design, and experienced craftsmanship to create highly versatile heat transfer that will integrate into your system and boost the efficiency of your business.

Why Clamp-On Assembly?

Applicable to Existing Systems

Apply Temp-Plate heat transfer surface to your existing equipment or vessel with pre-applied factory mastic for minimal operational downtime

Suited for High Pressures

Clamp-On Assembly is constructed to handle high pressures inside or outside your equipment

Temp-Plate in Oil Refining

Clamp-on Temp-Plate inflated heat transfer can be custom-manufactured to your specifications and attached to your vessel either on the inside or outside. The greatest benefit of a clamp-on application is its ease of installation within an existing process. Sometimes, as a process evolves, the need for a heat exchanger develops, but the floor plan may not have sufficient room for one. In this case, custom heat transfer can be clamped on to an existing vessel to serve as a heat exchanger without taking up any extra space.

Becon Engineering from Houston serves as a great example of this application. Becon was working on a project for Chevron, which required hot water for a demineralized water dilution heater in the middle of the oil refining process. Because there was no nearby power source available to supply the hot water, Becon clamped 51 square feet of Temp-Plate to a 14" high pressure steam line – the only available heat source. In this case, Temp-Plate offered an engineering firm the flexibility to economically solve an otherwise expensive problem.

Temp-Plate Drum Dryer

Food Processing

Looking for the next piece of your food processing operation? A Temp-Plate Drum Dryer may be your solution. Efficient, durable, and hygienic, our drum is crafted to dry liquid or pureed raw ingredients like fruits and vegetables and prepare them for the next step in your process. Whether you are making potato chips, nutritional supplement powder, pet food, or dried fruit, Temp-Plate Drum Dryer is up to the challenge.

Carpet and Textile Capabilities

Paul Mueller Company's Temp-Plate Drum Dryer has been crafted to safeguard your carpet fibers from overheating. This is achieved through strategic design which produces low volume, turbulent action and high velocity, making steam condensation extremely efficient. To learn more about how our drum dryers act as a top alternative to gas fired dryers and can protect your investment, contact a Paul Mueller Company representative today.

Why Drum Assembly?

High Efficiency

Temp-Plate requires less steam than traditional drums

Hygienic

Constructed with food-grade materials and polishes

Academy

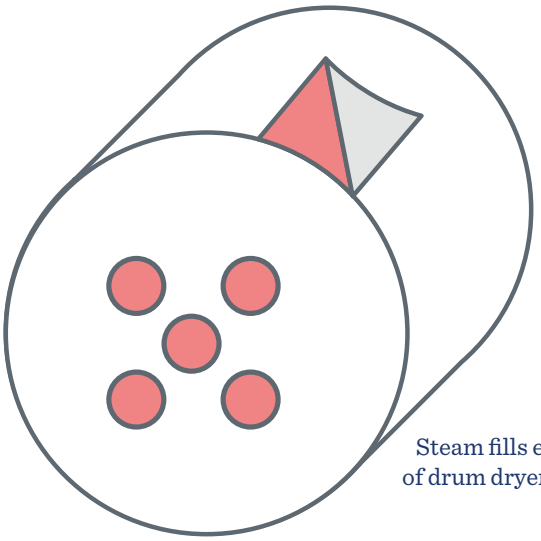
Visit **ACADEMY.PAULMUELLER.COM** to learn more about Temp-Plate Drum Drying

The Benefits of Drum Drying in Dry Ingredient Production

In food processing, consistently producing a safe, high-quality, and economical product are top priorities. You and your customers rely on your processing equipment to achieve the results as intended. Depending on ingredients, budget, and factors specific to the process, there are options when choosing the right equipment to turn wet ingredients into flakes or powders. The flaked or powderized ingredients can be used in potato chips, nutritional supplements, pet food, and many more applications.

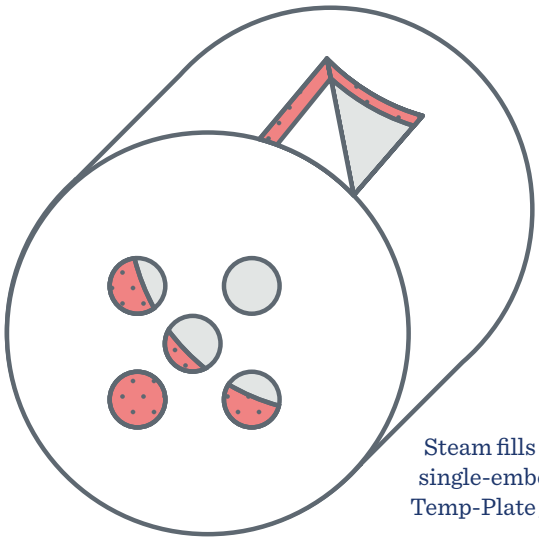
Having trusted equipment in your operation can make the difference in quality of final products, maintenance costs, and overall efficiency. Traditional drum drying has been used in food processing since the early 1900's. An innovative new approach to drum drying though, can expand the benefits and bring a money-saving advantage through efficient heat transfer.

Traditional Drum Dryer



Steam fills entirety of drum dryer interior

Temp-Plate® Drum Dryer



Steam fills only single-embossed Temp-Plate jacket

Temp-Plate Integral Heat Transfer

Assembled, tested, and ready for integration into your process. Paul Mueller Company can craft your vessel components with the required heat transfer surface as an integral welded component. The new equipment being comprised of Temp-Plate panels, requires less material to manufacture and provides high efficiency transfer rates, up to 2x that of some alternative options. Our experts will craft your tank, vessel, or other equipment start to finish and provide you with quality components and heat transfer technology.

Reach out to our industry experts at Paul Mueller Company about your processing needs and goals. We will find provide a detailed solution to optimize performance in your plant.

Common Formats

- Tank shell/cylinder assemblies
- Tank head assemblies
- Tank baffles
- Trough assemblies
- Food service and industrial pans
- Food cookers
- Hoppers
- Insertion heaters

Why Integral Assembly?

Assembled in Shop

Your equipment arrives ready to perform at maximum capacity

High Heat Transfer Rates

Integral assembly can provide higher heat transfer rates than alternatives

Temp-Plate Maintenance

Temp-Plate is a well constructed, durable piece of equipment, but can sometimes be subjected to harsh environments like chemical baths. Cleaning and maintenance precautions can be taken to ensure your Temp-Plate continues operating as efficiently as possible. Proper choice of material for a given application, in conjunction with a sensible cleaning and maintenance program, will ensure maximum performance and longevity.

There are two basic reasons for maintaining a clean surface: corrosion prevention and minimizing heat transfer resistance. Scale build-up on the surface reduces the heat transfer rate significantly because of the poor conductivity of the scale. The thermal resistance of the scale can easily be an order of magnitude or greater than the metal wall of the Temp-Plate itself.

Cleaning Methods

Chemical

Some applications, such as metal finishing, can lead to scale on the Temp-Plate that requires the use of chemical cleaning. Your Temp-Plate application must be taken into consideration when choosing a cleaner, as chemicals effective for scale removal may induce corrosion. When attempting to chemically remove scaling from your Temp-Plate panels, consider consulting with a chemical solution provider when deciding on which chemicals to use.

Mechanical

Mechanical cleaning may involve spraying with high-pressure water or use of wire brushing. Temp-Plate's pillowed effect is relatively easy to clean. Swabbing, brushing, or spraying are preferred cleaning methods when deposits are soft enough to be removed.

Foul Free 100 Coating

Depending on your Temp-Plate application, a layer of defense may be needed to prevent the problems of scaling and corrosion. Mueller Foul Free 100 Coating can be applied to your panels, better equipping them for harsh conditions.

Services

Calculations

The right heat transfer can make a significant impact on the efficiency and sustainability of your processes. Our application engineers are committed to providing precise heat transfer calculations to maximize your process and minimize waste. Control the temperature of any volume or type of liquid using our versatile heat transfer surfaces in a wide variety of applications. Our engineers will work with you to design the perfect heat transfer application for your quality product.

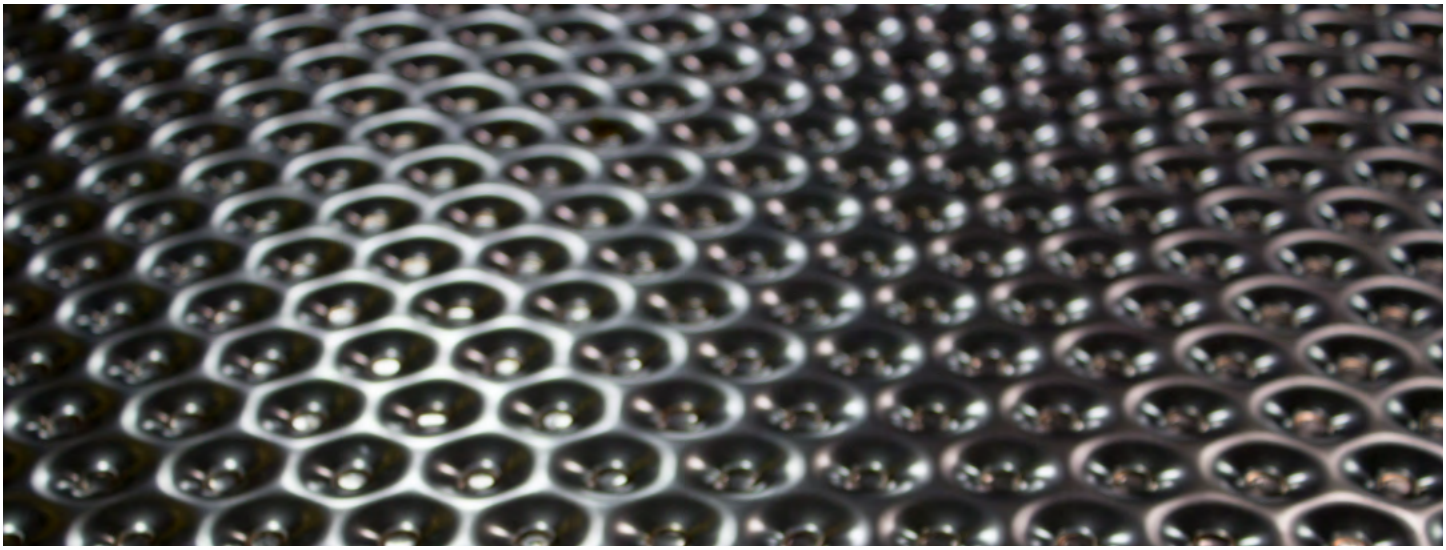
Certified Repairs

Our repairs can meet ASME Code, API, and 3-A Standards.

Installation

Whether you need a new heat transfer system installed or your existing system modified, our Paul Mueller Company service technicians have the necessary experience to deliver your energy source where you need it most.

Depending on your specific application, we can help you engineer the most efficient heat transfer solution for your equipment and provide installation. With our expertise, we can ensure that your heat transfer system is keeping your process at the right temperatures.



Delivery of your Temp-Plate

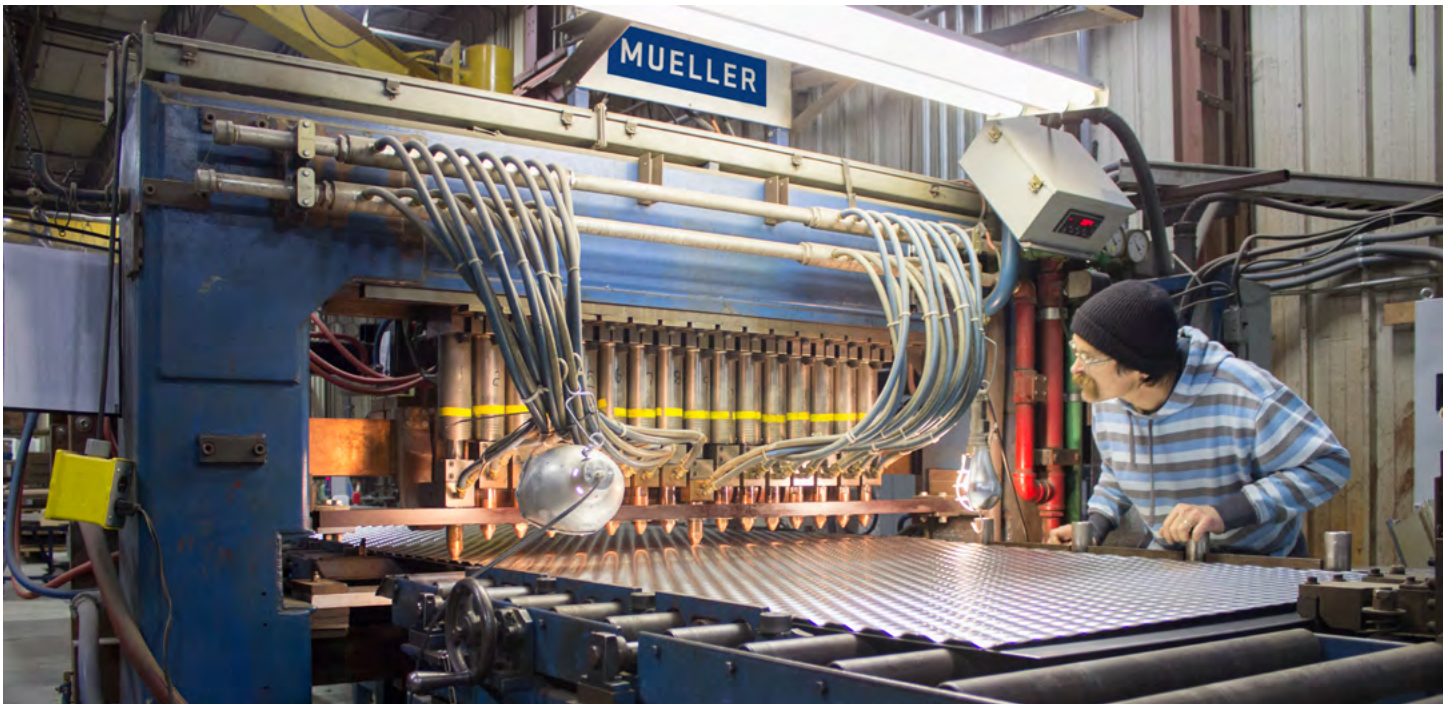
Mueller Transportation Inc., a subsidiary of Paul Mueller Company, has the capability to deliver equipment by our own fleet of trucks and experienced drivers.

Seamless Equipment Transportation

Crafting your new equipment is just one piece of the project. Mueller Transportation Inc. provides complete oversight, care, and delivery of your equipment, no matter the shape or size. Safety and on-time delivery are top priorities as we make the transition from our manufacturing floor to your front door.

Hassle Free

Our team of specialized drivers and installers take full responsibility of your equipment through delivery, installation, and beyond. With more than 100 years of combined service and experience in the industry, Mueller Transportation minimizes risk and keeps your project on track.



Getting Started

At Paul Mueller Company, we take pride in delivering a quality customer experience from your first interaction with us and beyond. We will provide the necessary resources to guide you through the entire quoting and design process, so the final product meets all details and is unique to your process.

Request a Quote

We make implementing Temp-Plate Inflated Heat Transfer into your operation informative, helpful, and stress free. Our representatives are knowledgeable and ready to work with you.

- To request a quote, start by visiting us at paulmueller.com/quote
- Fill out the Request for Quote form to the best of your ability
- Provide as much detail as possible for your application, pressure allowances, mediums, etc.
- Attach files that may be informative regarding your process
- Click “Submit”
- A Mueller representative will be in contact with you as soon as possible

Consult with Our Experts

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Heat Transfer Manufacturing Representative Locator

Nearly 100 Paul Mueller Company representatives across the globe are trained, knowledgeable, and ready to provide a solution for your heat transfer needs.

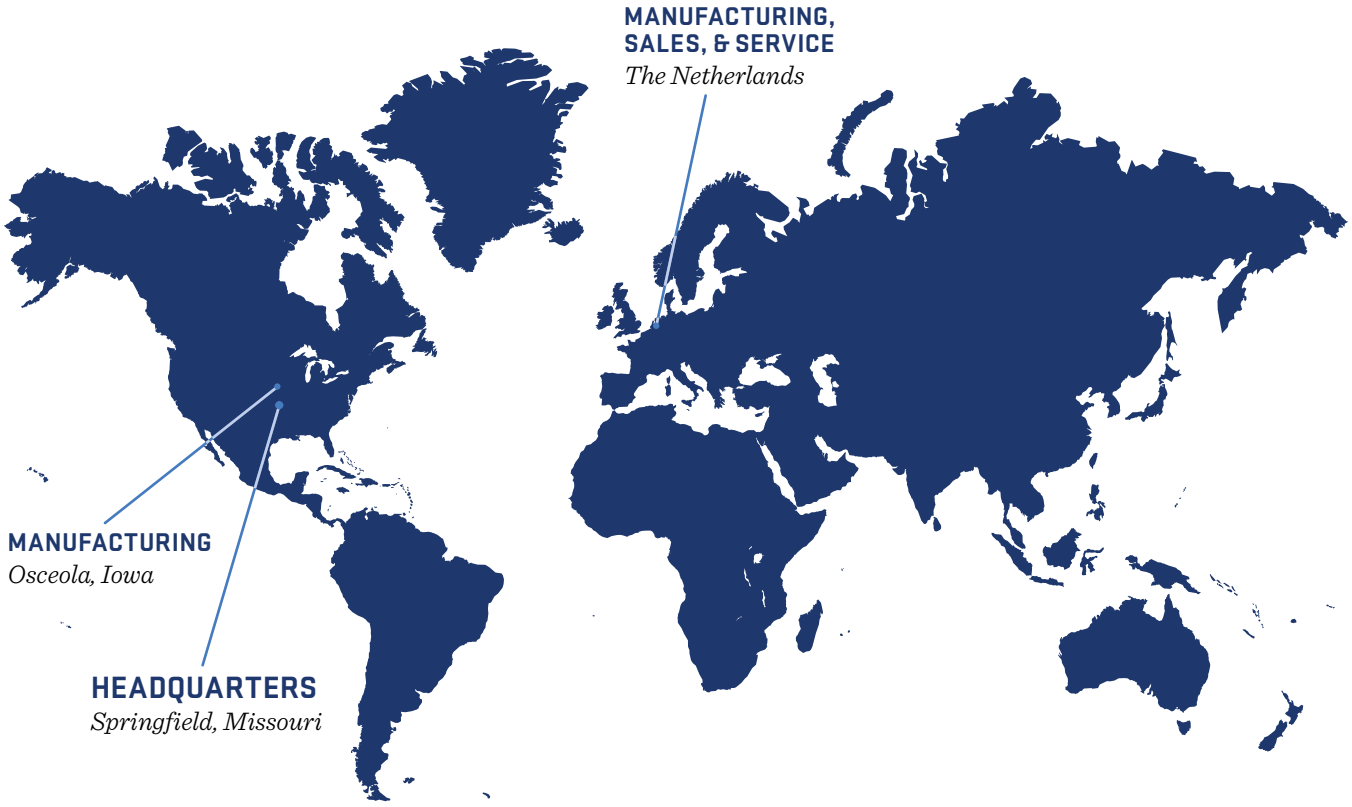
Our online interactive tool displays our heat transfer representative names, locations, contact information, and directions. To speak to the representative nearest you, visit:

paulmueller.com/heat-transfer-representatives

PAUL MUELLER COMPANY

PAUL MUELLER, OUR FOUNDER

At Paul Mueller Company, we are united by a belief that the only quality that matters is quality that works for life. With every piece of processing equipment we build, our goal is to have lasting impact. This collective vision has led us from a small sheet metal shop to a global supplier of heating, cooling, processing, and storage solutions. Our equipment allows experts from a variety of industries recover energy and keep their products at optimal temperatures. Whether our equipment is used in a surgical operating room or on a food production line, we are making an impact across the globe.



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